

How to freeze drops with powders

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Abstract

This document accompanies fluid dynamics video entry V83911 for APS DFD 2012 meeting. In this video, we present experiments on how drop oscillations can be "frozen" using hydrophobic powders.

1 Introduction

In this video (ref), we show that when a liquid drop impacts a powder which is superhydrophobic, the drop rebounds with a powder coating that can "freeze" the oscillations and yield a deformed (i.e. non-spherical) liquid marble. For water drops, the critical impact speed for the onset of this phenomenon is $V_c = 1.6$ m/s. Repeat experiments with more viscous drops show even more deformed shapes.

For further information, please see the following article:

1. Marston et al. (2010) *Powder Technol.* **202**, 223-236.
2. Marston et al. (2012) *Powder Technol.* **228**, 424-428.